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09/882,815

06/15/2001

Thomas N. Jackson

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10/21/2003

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EXAMINER

NGUYEN, TRUNG Q

ART UNIT

PAPER NUMBER

2829

DATE MAILED: 10/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/882,815

Applicant(s)

JACKSON, THOMAS N.

Examiner

Trung Q Nguyen

Art Unit

2829

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on amendment filed on 09/24/03.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: page 8, line 22, "radii" does not mean anything. Appropriate correction is required. In addition, Applicants are required to check through the drawing and specification to filter out such above informalities.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lindsay et al. (U.S. 5,495,109) in view of Nakagawa (U.S. 5,730,940)

As to claims 1 and 16-17, Lindsay et al. disclose in Figures 1 and 5 a method for measuring an electrical characteristic on a molecular scale comprising probing a molecular layer 22 of Fig. 1 or 26 of Fig. 5 (see column 5, lines 63-64 and column 6, lines 20-25) using atomic force microscopy (column 1, lines 18-20) having a cantilever 22 of Fig. 5 including a large contact area probe tip 23 of Fig. 5 by controlling the force applied to probe tip (column 5, lines 34-41); detecting (via detector 42 and electrometer

34) in response to probing and electrical characteristic of molecular layer (column 5 line 63 to column 6, line 6).

Lindsay et al. fail to disclose the probe tip having a radius greater than 100 nm. However, Nakagawa discloses a probe tip has a radius greater than 100nm (column 8, lines 20-26).

Therefore, at the time of the subject invention, it would have been obvious for a person of ordinary skill in the art to modify the device of Lindsay et al. by replacing the probe tip having a radius greater than 100nm as taught by Nakagawa because using a large radius probe tip enables the force applied thereto to be distributed over a larger area, thereby causing less penetration of the probe tip. In addition, large radius probe tip are readily available as disclosed in the specification of the instant application on page 8, line 23.

As to claims 2 and 9, Lindsay et al. disclose the contact area probe tip comprises a large radius sphere affixed to the cantilever (column 7, lines 44-52).

As to claims 3 and 12, Lindsay et al. disclose the step of probing includes varying the force applied to probe tip 22 or cantilever 22 (column 6, lines 2-6).

As to claims 4 and 13, Lindsay et al. disclose in Figure 3 electrical characteristic is selected from current and voltage (column 2, lines 12-31).

As to claim 5, Lindsay et al. disclose in Figure 5 the step of detecting (via detector 42 and electrometer 34) includes coupling molecular layer (top surface of substrate 26), cantilever 22, and electro meter 34 to each other in a circuit (see Fig. 5).

As to claims 6 and 14, Lindsay et al. disclose the molecular layer is at least one selected from the group consisting of monolayer 26 of Fig. 5 (see column 5, lines 63-64 and column 6, lines 20-25).

As to claim 7, Lindsay et al. disclose molecular layer is assembled by selected from ion beam sputtering (column 5, lines 29-34).

As to claim 8, Lindsay et al. disclose in Figures 1 and 5 a system for measuring an electrical characteristic on a molecular scale comprising probing a molecular layer 22 of Fig. 1 or 26 of Fig. 5 (see column 5, lines 63-64 and column 6, lines 20-25), subject to having electrical characteristic thereof measured (via electrometer 34 of Fig. 5) using an atomic force microscopy (column 1, lines 18-20) having a cantilever 22 of Fig. 5 including a large contact area probe tip 23 of Fig. 5; a meter 34 couple to molecular layer 26 (Fig. 5) and cantilever 22 (see Fig. 5) for detecting (via detector 42 and electrometer 34) in response to probing and electrical characteristic of molecular layer (column 5 line 63 to column 6, line 6).

As to claim 10, Lindsay et al. disclose in Figure 5 cantilever 22 and large contact area probe tip 23 comprise at least an electrically conductive coating, the cantilever and large contact area probe tip are electrically conductive (column 1, lines 30-35).

As to claim 11, Lindsay et al. disclose molecular layer 26 is probed by controlling the force applied to probe tip (column 5, lines 34-41).

As to claim 15, Lindsay et al. disclose the molecular layer is assembled by Langmuir-Blodgett deposition (column 8, lines 18-25).

Response to Arguments/Amendment

4. Applicant's amendment with respect to claims 1-17 have been considered but are moot in view of the new ground(s) of rejection.

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6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Trung Nguyen whose telephone number is 703-305-4925. The examiner can normally be reached on Monday through Friday, 8:30AM – 5:00PM. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-5841. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cuneo Kammie can be reached at (703) 308-1233.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)-308-0956.

Trung Nguyen

Patent Examiner
Group Art Unit 2829
October 14, 2003



ERNEST KARLSEN
PRIMARY EXAMINER